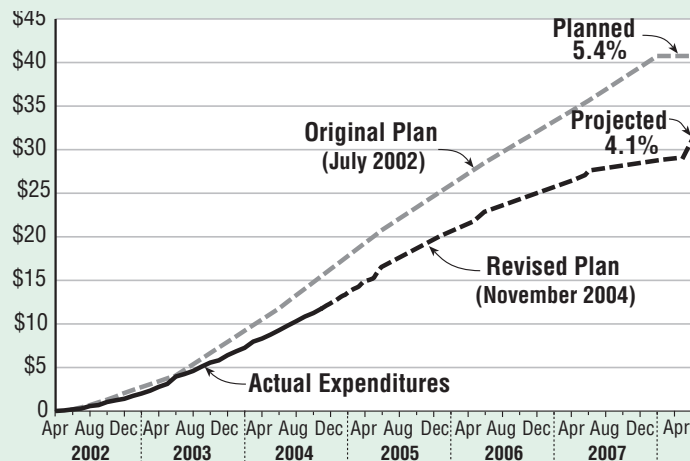


### Project Management Comparison

In the graph below, project management percentages are shown as a percentage of the total project capital costs through November 2004. The project management costs were planned to be 5.4% at project completion, falling in the mid-range level when compared to 4.1% for Utah's I-15 Corridor Mega project to 7% for South Carolina's Cooper River Bridge project. At current expenditure rates the actual management and oversight costs are likely to be lower.

#### Project Management Comparison of Planned and Actual Expenditures

Cumulative Cost as a Percent of Capital Cost Amount



Note: Projected Project Management is 4.1% of \$761 M Capital Cost Amount.

### Project Contingency Comparison

In the graph below, the project contingency budget is shown as a percentage of total project capital costs. The project contingency budget allows TNB project managers to aggressively address unanticipated costs, such as community requests, and cover WSDOT risk elements such as project scope changes. The costs were projected to be 7.2% at project completion, mid range when compared to 4.9% for the I-15 Corridor Mega Project and 9% for Florida's St. John River Bridge project.

#### Project Contingency Comparison of Planned and Actual Expenditures

Cumulative Percentage of Capital Cost Amount



### Contingency Funds Committed

A design-build contract usually lowers the owner's (WSDOT's) risk and reduces project cost growth. There are both planned expenditures (not included in the design-build contract) and unplanned expenditures due to contract changes. Planned expenditures include right-of-way settlement costs and removal of contaminated soils. Unplanned changes include scope changes as a result of community requests, permits, and other WSDOT unanticipated project needs. In this project, a contingency budget was included to cover such expenditures. One of WSDOT's goals is to minimize additions to the project cost while at the same time addressing community concerns to the greatest extent possible.

Some change orders actually reduce project scope, resulting in savings. For example, TNC asked to replace a retaining wall with a standard slope, resulting in a \$62,500 savings.

The table below shows contingency funds committed as of November 30, 2004.

	Amount
Right-of-Way/Inter-Agency Settlements	\$4,377,875
Planned/Known Change Orders	\$1,845,577
Community Driven Change Orders	\$766,206
Permit Driven Change Orders	\$389,892
WSDOT Initiated Change Orders	\$861,993
Design-Builder Initiated Change Orders	-\$739,972
<b>Total</b>	<b>\$7,501,572</b>

### Lessons Learned

WSDOT and TNC recently celebrated the project's two-year anniversary. WSDOT project staff provided a "second-year lessons learned" seminar to other WSDOT staff involved in future design-build projects. Key concepts included:

- Hiring knowledgeable staff with the expertise and experience required to oversee large and complex projects;
- Continuous communication between owner and design-builder is vital; ideally the two groups are located in the same offices and staff are "zippered," meaning owner and design-builder staff interact regularly with their equivalent counterparts;
- Agreement on owner/design-builder roles and responsibilities, and identifying an issue-resolution process that includes executive management involvement;
- Creating an excellent issue-tracking system to manage issues as they arise;
- Appreciating the speed at which design-build projects move forward and making decisions in a timely manner;
- Creating a system to manage risks and contingencies.

### Conclusion

Almost 28 months into the Tacoma Narrows Bridge project, Washington state citizens are receiving a quality project on time and within budget.

photos Tacoma Narrows Constructors



Computer enhanced photo of future bridge



Towers over 200 feet high



Roof construction on tolls operations building

December 31, 2004

This folio highlights information contained in WSDOT's 2004 report to the Washington State Legislature on the status of the Tacoma Narrows Bridge project.

The entire report may be obtained from WSDOT's Tacoma Narrows Bridge Office at (253) 534-4640.

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(1-877-762-7769)

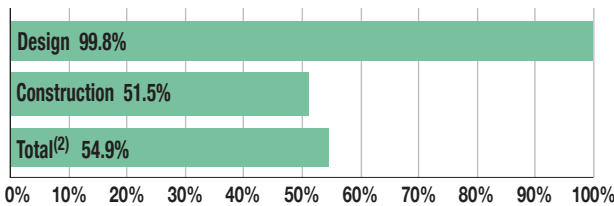
## Tacoma Narrows Bridge Legislative Update

*The Legislative Oversight Committee (LOC), created by an amendment to the 2002 Public Private Initiatives in Transportation Act, monitors and reports on the progress, execution and efficiency of design-build projects. WSDOT's Tacoma Narrows Bridge project (TNB) is currently the only design-build project that exists under the PPI Act. Information contained in this folio summarizes project accomplishments through its second year of construction.*

### Project Progress

On September 25, 2002, WSDOT issued Notices to Proceed to design-builder Tacoma Narrows Constructors (TNC – a joint venture between Bechtel Infrastructure and Kiewit Pacific) and Transcore (toll facility operator). Since then, the amount of work accomplished on the project has been impressive. Just over two years into this 5½ year project, the work is over half complete. The graph on the right illustrates the many milestones achieved in 2004 alone. The project experience is proving design-build as an effective and efficient method of project delivery.

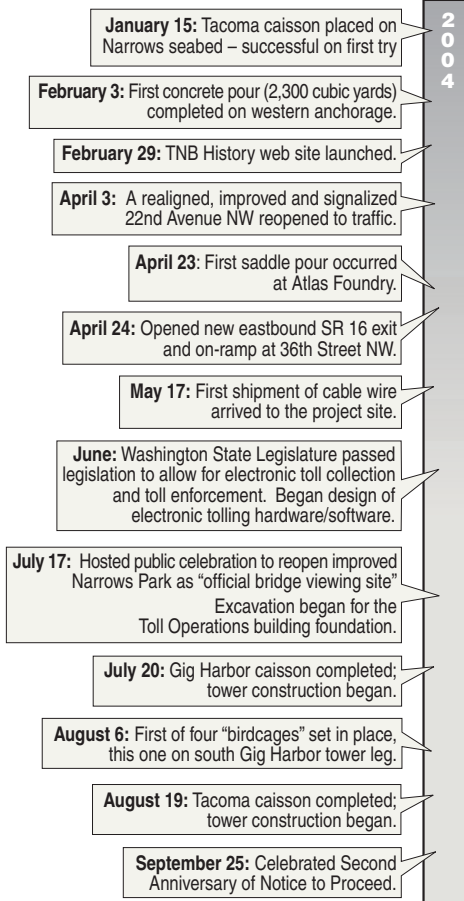
#### Project Progress To Date<sup>1</sup>



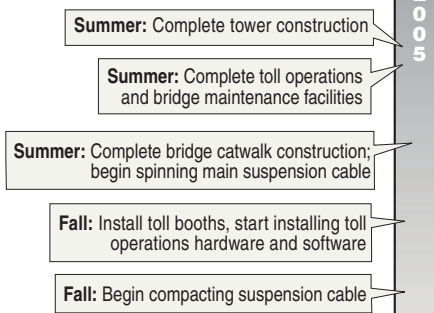
<sup>(1)</sup> Percentages calculated as of November 30, 2004

<sup>(2)</sup> Weighted 7% Design progress and 93% Construction progress

#### Milestones Achieved in 2004



#### Milestones Scheduled for 2005







Future bridge deck under construction in Korea



A suspended concrete bucket delivers concrete to towers



Deck girders set on west anchorage will support future roadway.



Concrete is placed for retaining wall alongside toll plaza



Crews install toll canopy roof



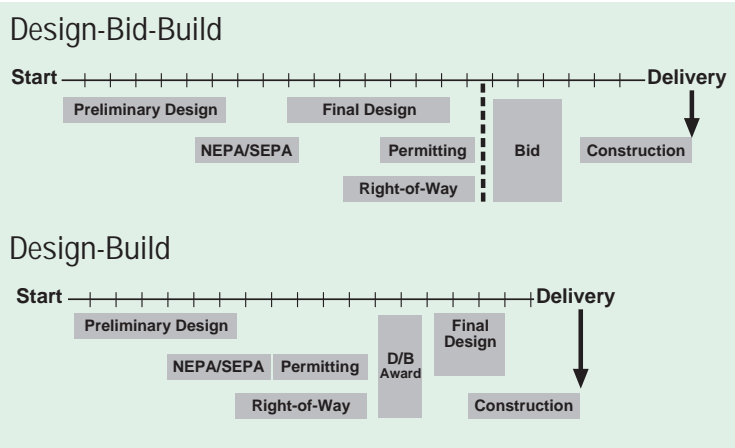
A tower crane hoists building materials alongside tower under construction

## Toll System and Toll Collection Legislation

TransCore is progressing with the toll collection and accounting system (TCAAS) work. Work to date has been submittal of design documents with on-site work expected to begin in March 2005. Through November 2004, the TCAAS is about 20% complete. During the 2004 legislative session, legislation was passed to define toll collection and transponder compatibility. WSDOT toll staff are developing Washington Administrative Code rules to specify toll collection policies & transponder compatibility. The rules are expected to be established by end of 2005.

## Design-Bid-Build vs. Design-Build Contracting

WSDOT's traditional contracting method is called design-bid-build, in which design work is completed prior to construction. In addition, right-of-way procurement, environmental permits, local agency agreements, and utility agreements are all either very well defined or in place prior to awarding the construction contract. In design-build contracting, both project design and construction occur under one contract. WSDOT selects one company, or a group of companies working together, to fulfill contractual requirements for the entire project under a single contract. Preliminary design, right-of-way procurement, environmental permits, and local agency agreements are usually still completed prior to contract award, but final design is the responsibility of the design-builder rather than WSDOT. A design-build contractor may begin constructing a project before project design is complete, and the design-builder assumes risk associated with simultaneous work. Examples of risk include costs associated with project materials, weather delays, labor relations, site conditions, or any number of other issues. The graph below compares typical timelines of design-bid-build and design-build projects.



## Design-Build Advantages

- Design-build contracting promises innovative approaches that can lead to greater efficiencies in project delivery. The main advantages are:
- Faster project delivery;
  - Reduced conflicts with project owners;
  - The design-builder is free to maximize design efficiencies in the most cost-efficient way as long as performance and technical requirements are met;
  - Reduced numbers of claims and change orders; and
  - Smaller owner workforce needed.

## Design-Build Challenges

- The benefits of design-build contracting must be evaluated with the following challenges to project delivery:
- With a single contract for design and construction, funding for all phases of work must be committed at the beginning of the project.
  - Transferring the majority of project risk from WSDOT to the design-builder can result in higher contingencies in contract price.
  - The final product is generally not defined when construction begins, presenting communication challenges to interest groups and the public. If the public and interest groups want changes in the final design, these changes may be costly due to their impact on the construction schedule.

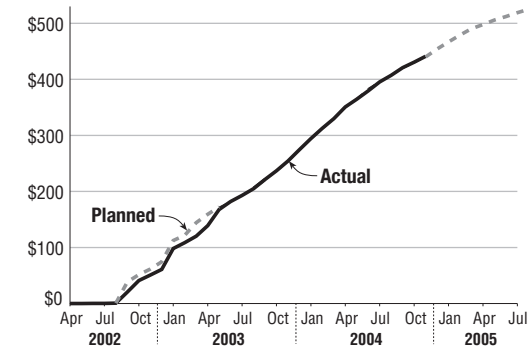
## Project Execution

### Cash Flow

The capital cost for the Tacoma Narrows Bridge project is \$760.4 million. The table and graph shown below and on the next page illustrate planned project cash flow vs. actual expenditures. They show that actual project expenditures meet the contract expenditure plan. Financing costs and reserve debt service during construction bring the total projected cost of the project to \$849 million.

Project Cost Summary (in Millions)	Budgeted	Expended
Design-Build Contract	615.0	427.9
Toll System Contract	9.2	1.8
WSDOT Oversight	41.0	11.7
Contingencies	54.7	4.2
Phase I Dev. Cost (UIW)	40.5	39.9
Total	760.4	485.5
<b>Total Expended/Total Cost</b>		<b>63.8%</b>

### Project Cash Flow (through 03-05 Biennium, in Millions)



## Quality Oversight

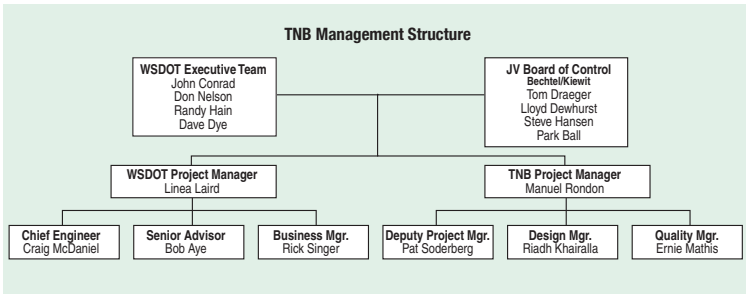
Traditionally, WSDOT staff perform quality control (QC) and quality assurance (QA) tests. In design-build contracts, the design-builder performs all QC and QA tests. WSDOT's responsibility is to monitor and audit those activities, and perform Quality Verification (QV) tests. WSDOT hired Delcan Inc. to help develop a comprehensive project quality compliance audit system. The compliance audit system combines audits with materials testing and a verification process, and it focuses on two areas of audits: 1) construction auditing (assessment of TNC's construction quality management techniques and products); and 2) management system auditing (all other project requirements). This program was fully implemented in September 2003. Since then, findings from 459 audits indicate that TNC's design and construction work and management processes are proceeding in compliance with the design-build agreement.

## Public Opinion Survey

WSDOT conducted its second annual public opinion survey to assess trends in public awareness, opinions, and perceptions of the project. The statistically significant survey sampled 501 households within areas affected by the project. The survey helped identify project issues most important to the public, communications strategies to meet public information needs, and public expectations of the project. Survey results are positive both on their own and when compared to last year's survey. The 2004 report shows that the level of "satisfied" respondents increased and the level of "dissatisfied" respondents decreased when compared to the 2003 results. For instance, in 2003, 77 percent of respondents said they had enough information about the project, in comparison to 80 percent in 2004. When asked their overall opinion of the project in 2003, 61 percent felt either "favorable" or "somewhat favorable." In 2004, that number increased to 69 percent. The data will help identify communication focus areas in 2005. Survey results are available through the project office at (253) 534-4646.

## Management Oversight

Strong executive leaders are key to ensuring that both TNC and WSDOT management teams are focused on delivering key project goals and objectives. WSDOT and TNC executives jointly attend quarterly meetings and regularly visit the project to follow progress and help resolve issues. WSDOT executives also meet monthly with project managers to provide oversight on project activities.



## Project Efficiency

- WSDOT has developed three efficiency measures to evaluate the effectiveness of design-build contracting:
- Schedule comparisons between design-bid-build and design-build projects;
  - Project management and oversight budgets as a percentage of total capital costs;
  - Contingency budget as a percent of total capital costs.

One of the most notable benefits of design-build contracting is a shortened project schedule. The graph below compares a traditional project timeline with the current design-build project schedule. Because of simultaneous design and construction, the design-build timeline is almost 25% (23 months) shorter than a traditional schedule. To date, the project is on schedule.

### Design-Build vs. "Likely" Design-Bid-Build Schedule Project Progress through November 2004

